PLEASE READ

Please check the A page for change information.

Since Hill-Rom Air-Shields conducts a continuous product improvement program, circuit and component improvements are sometimes incorporated into equipment before they can be incorporated into the printed manuals. When this occurs, changed material is provided on separate sheets at the rear of the manual or under separate cover in the form of a change package. Changed material on each page of text is indicated by a vertical bar in the margin next to the changed material, as shown on the right.

THIS MANUAL CONTAINS PROPRIETARY INFORMATION. REPAIRS AND AUTHORIZED MODIFICATIONS SHOULD BE PERFORMED ONLY BY QUALIFIED SERVICE PERSONNEL TO MAINTAIN YOUR WARRANTY AND TO AVOID CREATING SAFETY HAZARDS. WE CANNOT ASSUME RESPONSIBILITY FOR ANY CONDITIONS AFFECTING THE PROPER OPERATION OF THIS EQUIPMENT WHICH MAY RESULT FROM UNAUTHORIZED REPAIR OR MODIFICATION.

NOTE ON REPLACEMENT PARTS

Some parts used in your equipment may be different than those which appear in the Parts List of this manual. This sometimes occurs due to difficulty in parts procurement, but does not alter the function of the equipment. Order the part listed in the Parts List. Refer to Section 6 of this Manual for a listing of recommended spare parts.

NOTE: ALSO SEE PAGE 2.

LIST OF AVAILABLE MODIFICATION KITS

ITEM	DESCRIPTION AND PURPOSE	PART NO.
1	Filter Cover Knob/Retainer Replacement Kit	68 901 15
2	Deck Retainer Replacement Kit	68 901 22
3	Cable Assy Retrofit Kit. Provides Replacement Cable for AC Entry Board to Heater Board	68 908 00
4	ALL NON–ENGLISH, NON–120V UNITS Firmware Level 1.8 Eprom for 1 Incubator US/CANADIAN UNITS ONLY Firmware Level 1.8 US Eprom for 1 Incubator	 68 908 11 68 908 16
5	Pneumatic Tilt Lock–Up. Provides Incubators with a mechanism that prevents the mattress from locking up when pneumatically tilted fully into the Trendelenburg or Reverse Trendelenburg position. In addition, it allows the mattress to be locked into either tilt when the pneumatic tilts is disabled.	68 901 23
6	Controller Grounding Spring. Moves Controller Grounding Spring from top of Controller opening to the bottom of the opening.	68 901 25
7	Firmware Level 1.9 120V, English Units only Firmware Level 1.9, All Non–English, Non–120V Units	68 908 16 68 908 11
8	Right and Left Hood Baffles Replacement Kit	68 901 46
9	Hoods without Stops–High and Baffles with Stops High Hood with Three Access Doors and One Iris Port Replacement Kit High Hood with Two Access Doors and Two Iris Ports Replacement Kit	 68 901 48 68 901 48

LIST OF EFFECTIVE PAGES

PAGE NO.	CHANGE	PAGE
Front Cover	7	11/99
Warranty Page	7	11/99
1	7	11/99
2	4	6/94
A through D	7	11/99
i through iii	2	8/93
iv	6	8/96
v	5	3/95
vi	4	6/94
vii	5	3/95
viii through xii	4	6/94
1-1 and 1-2	4	6/94
1-3	0	5/92
1-4 through 1-7	4	6/94
1-8	5	3/95
2-1 through 2-8	0	5/92
2-2	5	3/95
2-3	0	5/92
2-4	5	3/95
2-5 through 2-8	0	5/92
2-9	3	12/93
2-10 through 2-13	2	8/93
2-14	3	12/93
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2-25 and 2-26	2	8/93
3-1	2	8/93
3-2 and 3-3	5	3/95
3-4 and 3-5	0	5/92
3-6	4	6/94
3-7	1	2/93
3-8 and 3-9	0	5/92
3-10	5	3/95
3-11 through 3-19	0	5/92

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3-21B	5	3/95
3-22	0	5/92
3-23	6	8/96
3-24	4	6/94
3-25	2	8/93
3-26	0	5/92
3-27	1	2/93
3-28 through 3-31	0	5/92
3-32 through 3-36	2	8/93
4-1	7	11/99
4-2 and 4-3	0	5/92
4-4	1	2/93
4-5	0	5/92
4-6 through 4-8	7	11/99
4-9	1	2/93
4-10	0	5/92
4-11 and 4-12	7	11/99
5-1 through 5-36	0	5/92
5-37 and 5-38	1	2/93
5-39 and 5-40	0	5/92
5-41	6	8/96
5-42 through 5-48	0	5/92
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5-50	2	8/93
5-51	1	2/93
5-52	4	6/94
5-53 through 5-56	0	5/92
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5-63 through 5-65	1	2/93
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6-4	0	5/92
6-5 and 6-6	4	6/94
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6-59	4	6/94
6-60	6	8/96
6-61	7	11/99
6-62	4	6/94
6-63	7	11/99
6-64 through 6-68	4	6/94
6-69	7	11/99
6-70	4	6/94
6-71	5	3/95
6-72 through 6-75	4	6/94
6-76	6	8/96
6-77	5	3/95
6-78	4	6/94
7-1 and 7-2	0	5/92
7-3	1	2/93
7-4	3	12/93
7-4A and 7-5	1	2/93
7-6 and 7-7	3	12/93
7-8	1	2/93
7-9 and 7-10	0	5/92

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LIST OF ILLUSTRATIONS (continued)

FIGURE **PAGE**

TABLE OF DEFINITIONS AND SYMBOLS

TECHNICAL DEFINITIONS

Control Zone. A plane 10 cm (4 in) above the mattress with an area defined by the center of four quadrants formed by lines that divide the width and length of the mattress surface.

Incubator Temperature. Air temperature at a point 10 cm (4 in) above and centered over the mattress surface

Steady Temperature Condition. The condition reached when the average **Incubator Temperature** does not vary more than 0.2 °C over a period of one hour.

Temperature Overshoot. The amount by which **Incubator Temperature** exceeds average **Incubator Temperature** during **Steady Temperature Condition,** resulting from a change in temperature.

Temperature Rise Time. The time required for the **Incubator Temperature** to rise 10 °C.

Temperature Uniformity. The amount by which the average temperature at each of four points 10 cm (4 in.) above the mattress surface differs from the average **Incubator Temperature** at **Steady Temperature Condition.** The four points are the centers of four quadrants formed by lines that divide the width and length of the mattress surface.

Temperature Variation. The difference between the **Incubator Temperature** and the **Average Incubator Temperature** during **Steady Temperature Condition**.

NOTE, IMPORTANT, CAUTION, AND WARNING

NOTE: *A Note is inserted in text to point out procedures or conditions which may otherwise be misinterpreted or overlooked. A Note may also be used to clarify apparently contradictory or confusing situations.*

IMPORTANT: *Similar to a Note but used where greater emphasis is required.*

CAUTION: A Caution is inserted in text to call attention to a procedure which, if not followed exactly, can lead to damage or destruction of the equipment or improper operation.

WARNING: A Warning is inserted in text to call attention to dangerous or hazardous conditions inherent to the operation, cleaning, and maintenance of the equipment which may result in personal injury or death of the operator or patient.

SYMBOLS

Attention; consult accompanying documents.

Type B equipment with an F type floating applied part.

Caution: Electric shock hazard. Refer service to qualified personnel.

AC power.

Protective earth (ground).

PRESS TO STOP/START TIMER

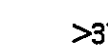
PRESS TO RESET/TURN OFF TIMER

LIGHTS TO INDICATE UNIT IS OPERATING IN BABY MODE

PRESS TO ENTER BABY

LIGHTS TO INDICATE UNIT IS OPERATING IN AIR MODE

PRESS TO ENTER AIR MODE



LIGHTS TO INDICATE TEMPERATURE OVERRIDE MODE

PRESS TO ENTER TEMPERATURE OVERRIDE MODE

PRESS TO ENTER SET TEMPERATURE

PRESS TO RAISE SET TEMPERATURE

PRESS TO SELECT CELSIUS OR FAHRENHEIT

PRESS TO SILENCE/RESET AUDIBLE ALARMS

LIGHTS TO INDICATE KEYPAD IS LOCKED

PRESS TO LOCK OR UNLOCK THE KEYPAD

PRESS TO TURN POWER ON OR OFF

SECTION 1
GENERAL INFORMATION

1.1 INTRODUCTION

This manual provides instructions for installation, maintenance and repair of the Isolette® Infant Incubators, Models C500 QT® and C550 QT® and C500 QT® and C550 QT® Model XL.

This manual is intended for use only by trained, qualified service personnel. Instructions for the operator of the equipment are provided in a separate operator's manual.

1.2 DESCRIPTION

1.2.1 ISOLETTE® INFANT INCUBATOR, MODEL C500

The Isolette® Infant Incubator, Model C500, provides air temperature control from 20 to 37 °C (37 to 39 °C in Temperature Override Mode) as selected by the **Air Set Temperature** Up/Down Arrow keys on the front panel.

1.2.2 ISOLETTE® INFANT INCUBATOR, MODEL C550

The Isolette® Infant Incubator, Model C550, provides air temperature control from 20 to 37 °C (37 to 39 °C in Temperature Override Mode) as selected by the **Air Set Temperature** Up/Down Arrow keys on the front panel.

In addition, it provides a sensing probe which can be attached directly to the infant's skin. Using this probe, the infant's temperature can be controlled from 34 to 37 °C (37 to 38 °C in Temperature Override Mode) as selected by the **Baby Set Temperature** Up/Down Arrow keys on the front panel.

1.3 ACCESSORIES

Accessories available for the C500/C550 QT® are listed below and illustrated in Figure 1.1. Refer to Section 6, Part Numbers, Additional Accessories, a list of operator–replaceable parts and single use items.

- Cabinet Stand
- Guard Rail
- Rail System for Standard Cabinet Stand
- SOLAIR™ Transparent Hood Warmer
- MICRO–LITE™ Phototherapy System
- DEW–ETTE® Incubator Humidifier (Not Shown)
- WARM WEIGH® Infant Scale, Model I20
- Remote Alarm Module
- VHA (Vertical Height Adjustable) Stand
- Rail System for VHA Stand
- Monitor Shelf Package
- Inner Walls (refer to Figure 4.2)
- ATHENA® Shelf Assembly

- ATHENA® PAM Mounting Kit
- Utility Pole Assembly
- IV Tree Assembly
- Ventilator Mounting Pole
- Oxygen Flowmeter Kit
- Air Flow Kit
- Suction Kit
- Blender Kit
- MICRO–LITE™ Pivot Arm Assembly

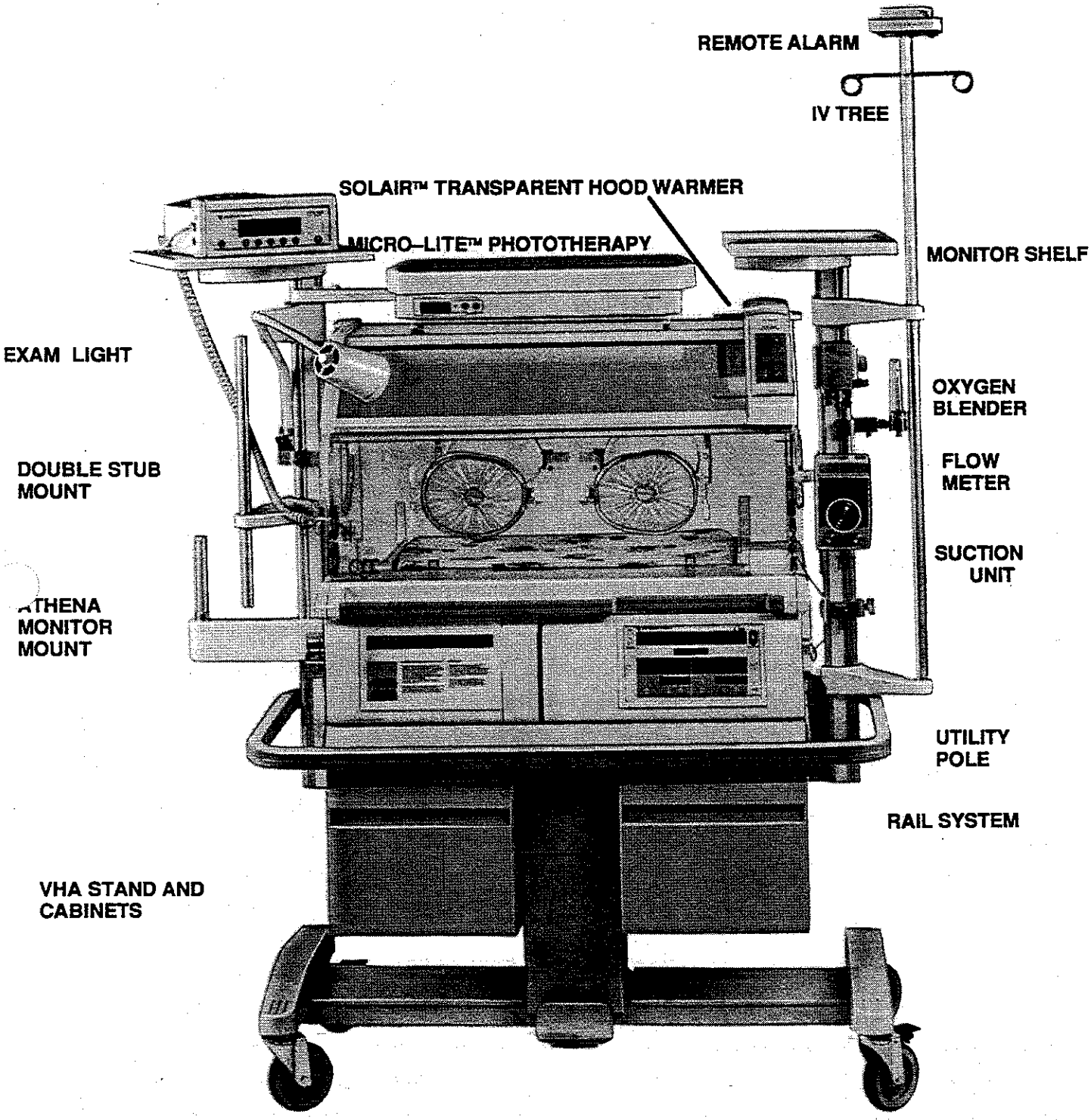


FIGURE 1.1 ACCESSORIES

1.4 MODEL IDENTIFICATION SERIES CHANGE

The Isolette® Infant Incubators, Models C500 QT® and C550 QT®, have two Data Tags which list model identification and series number. The locations of the data tags are as follows:

1. CONTROLLER: Located on the inside top panel.
2. HOOD/ SHELL ASSEMBLY: Located on the right side panel of the Shell.

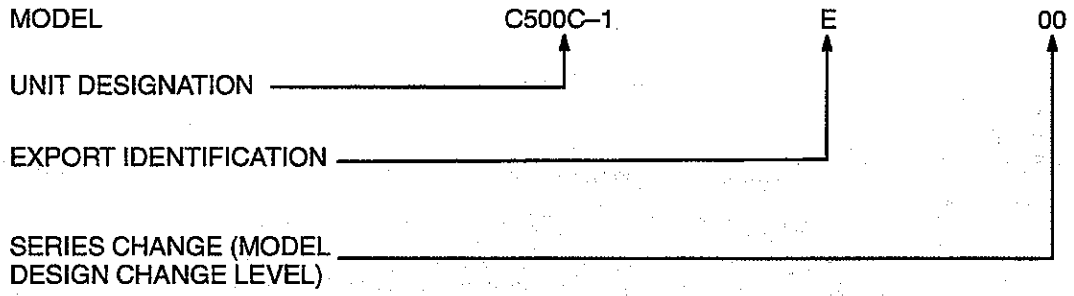


TABLE 1.1 SERIES CHANGE – CONTROLLER MODEL C500C–1 AND 1E

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

TABLE 1.2 SERIES CHANGE – CONTROLLER MODEL C550C–1 AND 1E

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

TABLE 1.3 SERIES CHANGE – CONTROLLER MODEL C500XLC–1 AND 1E

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

TABLE 1.4 SERIES CHANGE – CONTROLLER MODEL C550XLC–1 AND 1E

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

TABLE 1.5 SERIES CHANGE – HOOD/SHELL ASSEMBLY C500H–1 AND 1E 4 ACCESS DOORS, 2 IRIS PORTS, PNEUMATIC TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None
02	Redesign Mattress Stops on Hood and Access Panel	68 505 72 and 68 506 71

TABLE 1.6 SERIES CHANGE – HOOD/SHELL ASSEMBLY C500H–1 AND 1E 5 ACCESS DOORS, 1 IRIS PORT, PNEUMATIC TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None
03	Redesign Mattress Stops on Hood and Access Panel	68 505 71 and 68 506 71

TABLE 1.7 SERIES CHANGE – HOOD/SHELL ASSEMBLY C550H–1 AND 1E 4 ACCESS DOORS, 2 IRIS PORTS, PNEUMATIC TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
01	Original Design	None
02	Redesign Mattress Stops on Hood and Access Panel	68 505 72 and 68 506 71

TABLE 1.8 SERIES CHANGE – HOOD/SHELL ASSEMBLY C550H–1 AND 1E 5 ACCESS DOORS, 1 IRIS PORT, PNEUMATIC TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None
03	Redesign Mattress Stops on Hood and Access Panel	68 505 71 and 68 506 71

TABLE 1.9 SERIES CHANGE – HOOD/SHELL ASSEMBLY C500H–2 AND 2E 4 ACCESS DOORS, 2 IRIS PORTS, MANUAL TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None
02	Redesign Mattress Stops on Hood and Access Panel	68 505 72 and 68 506 80

TABLE 1.10 SERIES CHANGE – HOOD/SHELL ASSEMBLY C500H–2 AND 2E 5 ACCESS DOORS, 1 IRIS PORT, MANUAL TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None
03	Redesign Mattress Stops on Hood and Access Panel	68 505 71 and 68 506 80

TABLE 1.11 SERIES CHANGE – HOOD/SHELL ASSEMBLY C550H–2 AND 2E 4 ACCESS DOORS, 2 IRIS PORTS, MANUAL TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None
02	Redesign Mattress Stops on Hood and Access Panel	68 505 72 and 68 506 80

TABLE 1.12 SERIES CHANGE – HOOD/SHELL ASSEMBLY C550H–2 AND 2E 5 ACCESS DOORS, 1 IRIS PORT, MANUAL TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None
03	Redesign Mattress Stops on Hood and Access Panel	68 505 71 and 68 506 80

TABLE 1.13 SERIES CHANGE – HOOD/SHELL ASSEMBLY C500XLH–1 AND 1E 4 ACCESS DOORS, 2 IRIS PORTS, PNEUMATIC TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

TABLE 1.14 SERIES CHANGE – HOOD/SHELL ASSEMBLY C500XLH–1 AND 1E 5 ACCESS DOORS, 1 IRIS PORT, PNEUMATIC TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
01	Original Design	None

TABLE 1.15 SERIES CHANGE – HOOD/SHELL ASSEMBLY C550XLH–1 AND 1E 4 ACCESS DOORS, 2 IRIS PORTS, PNEUMATIC TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

TABLE 1.16 SERIES CHANGE – HOOD/SHELL ASSEMBLY C550XLH–1 AND 1E 5 ACCESS DOORS, 1 IRIS PORT, PNEUMATIC TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
01	Original Design	None

TABLE 1.17 SERIES CHANGE – HOOD/SHELL ASSEMBLY C500XLH–2 AND 2E 4 ACCESS DOORS, 2 IRIS PORTS, MANUAL TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

TABLE 1.18 SERIES CHANGE – HOOD/SHELL ASSEMBLY C500XLH–2 AND 2E 5 ACCESS DOORS, 1 IRIS PORT, MANUAL TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
01	Original Design	None

TABLE 1.19 SERIES CHANGE – HOOD/SHELL ASSEMBLY C550XLH–2 AND 2E 4 ACCESS DOORS, 2 IRIS PORTS, MANUAL TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

TABLE 1.20 SERIES CHANGE – HOOD/SHELL ASSEMBLY C550XLH–2 AND 2E 5 ACCESS DOORS, 1 IRIS PORT, MANUAL TILT

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
01	Original Design	None

TABLE 1.21 SERIES CHANGE –VHA STAND, MODELS VHS68–1,1E, 2 AND 2E

SERIES NO.	DESCRIPTION	ITEMS/ASSEMBLIES AFFECTED
00	Original Design	None

SECTION 2
INSTALLATION

2.1 UNPACKING

Typically, the Cabinet Stand (the optional VHA Stand), the Hood/Base Assembly, Filter/Filter Cover Assembly and the Guard Rail are shipped in separate cartons. When removing the equipment from the cartons, take care not to scratch or otherwise damage unprotected surfaces. Remove all packing materials from the Shell Assembly.

2.2 ASSEMBLY–INCUBATORS EQUIPPED WITH STANDARD CABINET STAND

CAUTION: Two people are required to assemble the Hood/Base Assembly and the Cabinet Stand.

Instructions for assembling the Incubator are provided below:

A. **REMOVE THE CONTROLLER FROM THE INCUBATOR.** Attach the Guard Rail to the underside of the Base Assembly using the 6 No. 10 x 1/2" Screws and Keps nuts supplied (see Figure 2.1). Replace the Controller.

B. **PLACE THE GUARD RAIL AND BASE ASSEMBLY** on the Cabinet Stand as shown in Figure 2.1.

WARNING: The Incubator must be attached to the Cabinet Stand using the clamps provided. Failure to do so could result in the Incubator separating from the stand if sufficiently tilted, particularly with the hood open.

C. **SECURE THE HOOD/BASE ASSEMBLY** to the Cabinet Stand using the clamp on each side of the Cabinet Stand. Adjust threaded clamp on the stand for positive latching. Locking bar should be approximately horizontal when clamp is engaged in retainer. Lock clamp by rotating locking bar to vertical position (see Figure 2.1).

IMPORTANT: *This Incubator has been shipped without a Filter and Filter Cover Assembly. The Filter Cover Assembly has been shipped in a separate carton. DO NOT place Incubator into use until properly installed.*

D. **INSTALL THE AIR FILTER AND FILTER COVER** on the rear of the unit (refer to Paragraph 2.7.2, Step K). If the unit is to be equipped with a Dew–ette® Incubator Humidifier, Model DH90, refer to the Operator's Manual for the Dew–ette® Incubator Humidifier and install the Air Intake Valve Assembly, Special Air Filter and Humidifier Filter Cover.

E. **CONNECT THE POWER CORD TO THE INCUBATOR.**

Screw, 10 – 32 x 1/2" (Qty 6)	99 042 01
Nut, Keps, 10 – 32 (Qty 6)	99 107 36

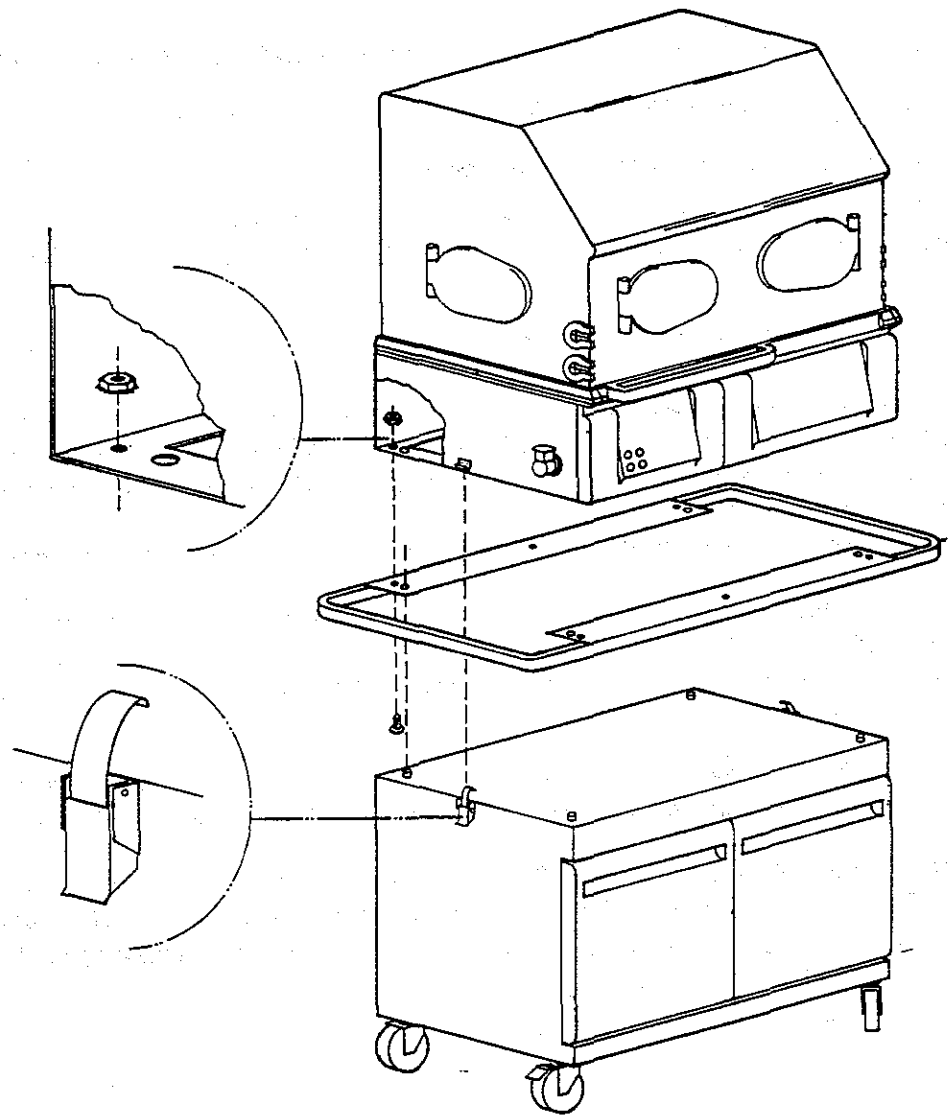


FIGURE 2.1 ASSEMBLY, INCUBATOR MOUNTED ON A STANDARD CABINET STAND

Change 5

2.3 ASSEMBLY–INCUBATORS EQUIPPED WITH OPTIONAL VERTICAL HEIGHT ADJUSTABLE STAND

CAUTION: Heavy Equipment – To prevent injury or damage to the Incubator/Stand, two persons of sufficient strength are required to adequately control the Incubator when transporting it.

CAUTION: Always lower the Incubator to its lowest position prior to transport for optimum stability.

A. **REMOVE THE CONTROLLER FROM THE INCUBATOR.** Attach the Guard Rail to the underside of the Base Assembly using the 6 bolts and lock nuts supplied (see Figure 2.2).

B. **PLACE THE GUARD RAIL AND BASE ASSEMBLY** on the VHA (Vertical Height Adjustable) Stand as shown in Figure 2.2.

WARNING: The Incubator must be attached securely to the VHA Stand using the clamps provided. Failure to do so could result in the Incubator separating from the stand if sufficiently tilted, particularly with the hood open.

C. **SECURE THE BASE ASSEMBLY** to the VHA Stand using the clamp on each side of the VHA Stand.

WARNING: The VHA Stand is intended for use with ISOLETTE® Infant Incubators which use the C500/550 QT® Incubator Base Assembly. DO NOT USE the VHA Stand with other Incubators. Incubator instability or tip–over could result.

IMPORTANT: *Check to be certain Incubator is firmly secured to the stand at both ends. Do not place in service if not firmly secured.*

IMPORTANT: *This Incubator has been shipped without a Filter and Filter Cover Assembly. Filter Cover Assembly has been shipped in a separate carton. DO NOT place Incubator into use until properly installed.*

D. **INSTALL THE AIR FILTER AND FILTER COVER** on the rear of the unit (refer to Paragraph 2.7.2, Step K). If the unit is to be equipped with a Dew–ette® Incubator Humidifier, Model DH90, refer to the Operator's Manual for the Dew–ette® Incubator Humidifier and install the Air Intake Valve Assembly, Special Air Filter and Humidifier Filter Cover.

E. **CONNECT THE VHA POWER CORD** to the wall receptacle and the interconnecting power cord on the VHA Stand to the Incubator power cord receptacle.

Screw, 10 – 32 x 1/2" (Qty 6)	99 042 01
Nut, Keps, 10 – 32 (Qty 6)	99 107 36

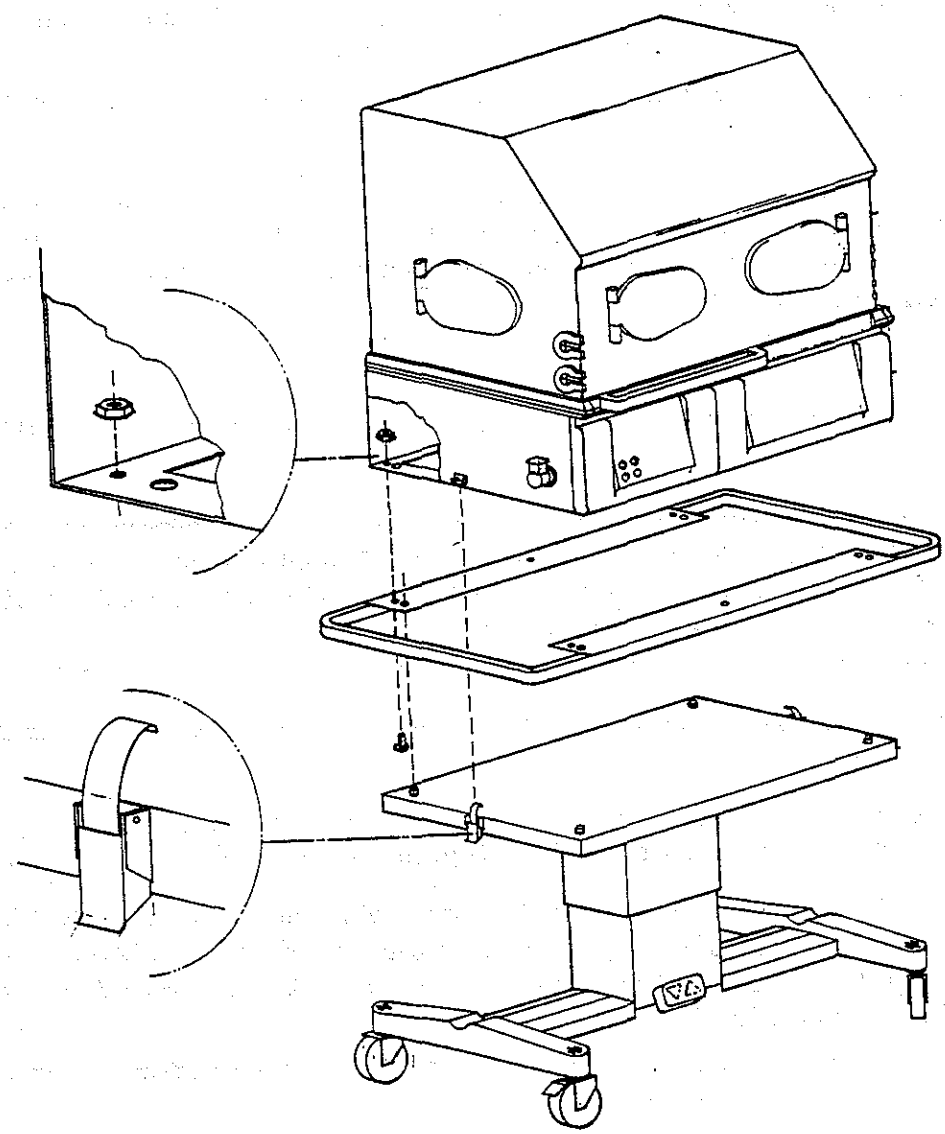


FIGURE 2.2 ASSEMBLY, INCUBATOR MOUNTED ON A VHA CABINET STAND

Change 5

2.4 INSTALLATION OF THE MATTRESS TILT BELLOWS

A. REMOVE THE MATTRESS TRAY and elevate the left and right ends of the Mattress Tilt Mechanism (Figure 2.3).

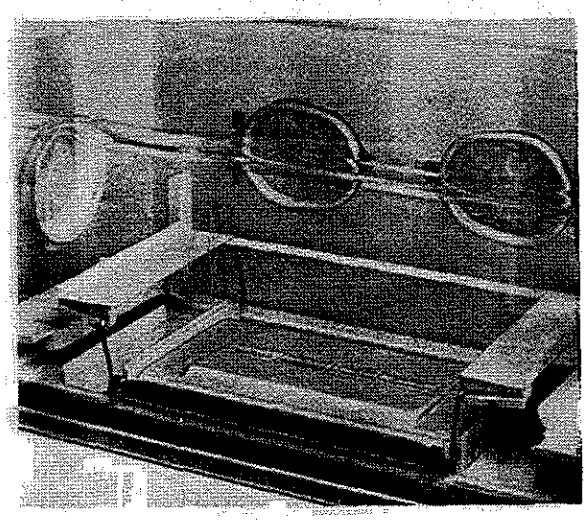


FIGURE 2.3 ELEVATE THE MATTRESS TILT MECHANISM

B. INSERT THE BELLOWS TUBE through the hole in the rear of the Incubator Hood (Figure 2.4).

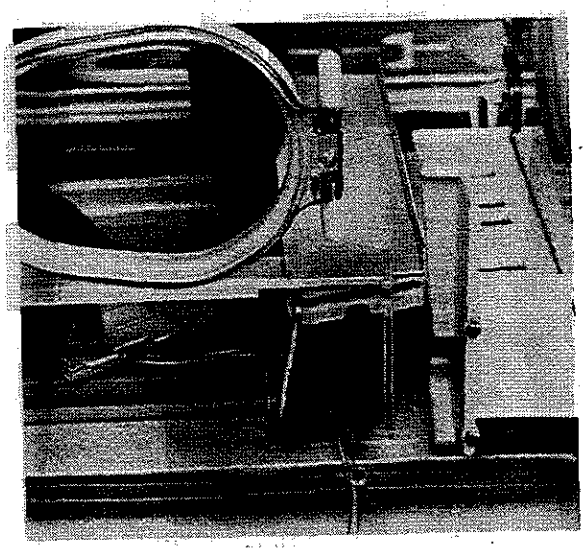


FIGURE 2.4 INSERT THE BELLOWS TUBE THROUGH THE HOOD

C. SLIDE A BELLOWS INTO THE LEFT SIDE OF THE TILT MECHANISM (REFER TO FIGURE 2.5).

FIGURE 2.5 INSTALL THE BELLOWS

D. CONNECT THE BELLOWS TUBE to the fitting below the hole by inserting the tube into the red collar as far as it will go (Figure 2.6).

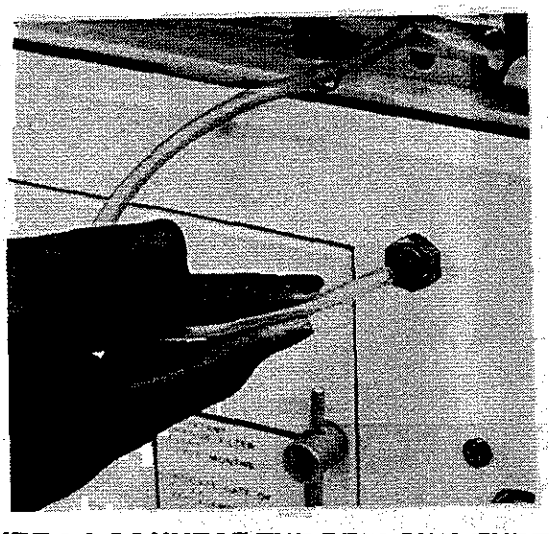


FIGURE 2.6 CONNECT THE BELLOWS TUBE

E. REPEAT STEPS B AND C for the right side bellows.

F. CONNECT A WALL AIR SOURCE to the DISS Fitting (Figure 4.4 of the Operator's Manual).

2.5 WARM WEIGH® INFANT SCALE, MODEL I20 (ACCESSORY)

For more information, refer to the I20/W30 Operator's Manual.

IMPORTANT: *The Load Cell must be unlocked before operating the scale. Refer to the I20/W30 Installation, Test and Calibration Instructions for the procedure.*

A. **OPEN FRONT ACCESS PANEL** of the Incubator.

B. **REMOVE THE MATTRESS** from the Incubator (Figure 2.7).

IMPORTANT: *Use the mattress provided with the scale. Use of the C500/550 QT® mattress may cause inaccurate readings due to interference with the surrounding walls.*

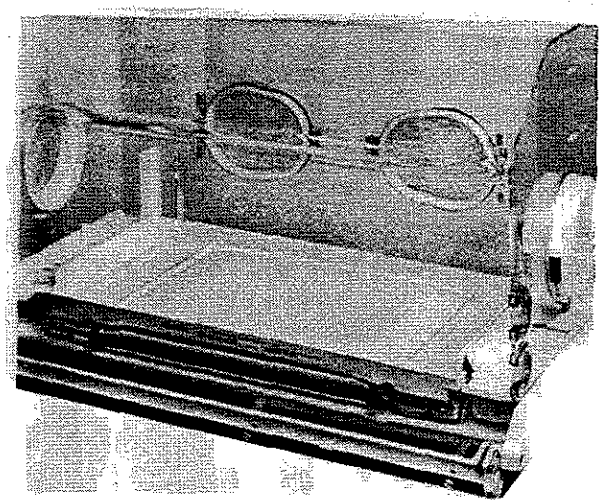


FIGURE 2.7 MATTRESS REMOVED FROM THE INCUBATOR

C. **INSTALL THE WEIGHING PLATFORM** in the Incubator Mattress Tray (Figure 2.8). Make sure it is level.

D. **PLACE THE MATTRESS TRAY AND MATTRESS PROVIDED** on the Weighing Platform (Figure 2.9).

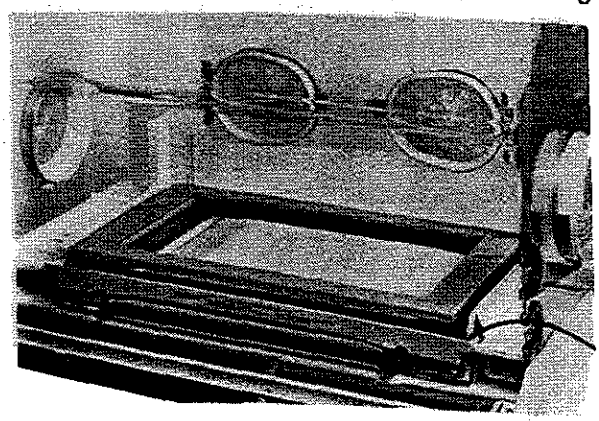


FIGURE 2.8 WEIGHING PLATFORM INSTALLED IN MATTRESS TRAY

E. INSERT THE CABLE INTO ONE OF THE HOOD ACCESS PORTS (Figure 2.8).

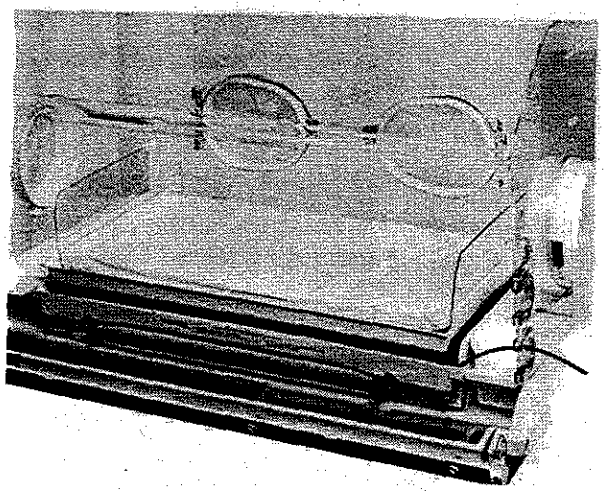


FIGURE 2.9 MATTRESS TRAY AND MATTRESS ON WEIGHING PLATFORM

2.6 CONFIGURING THE INCUBATOR

Upon installation, or at any time during use, the following Incubator parameters may be changed to meet the current needs of the operator. This is accomplished by first selecting the Configuration Menu. Refer to Paragraph 5.3.1. Then select the desired parameter.

2.6.1 PROCEDURAL SILENCE TIME

Procedural Silence Time is the length of time the alarms are silenced while the operator is performing routine procedures that may cause inadvertent alarms. The factory default setting is 15 minutes. The user may change this duration from 0 minutes up to 15 minutes in 1–minute increments. Refer to Paragraph 5.3.2 to set the Procedural Silence Time.

IMPORTANT: *Selecting a Procedural Silence Time of 0 minutes disables the Procedural Silence Time function.*

2.6.2 KEYPAD LOCK TIME DURATION

Keypad Time–to–Lock duration is the length of time the Keypad will remain unlocked after the last key depression. The factory default setting is 1 minute. The user may change this duration from 0 minutes up to 10 minutes in 1–minute increments. Refer to Paragraph 5.3.3 to set the Keypad Lock Time.

IMPORTANT: *If a time duration of 0 minutes is selected, the Keypad will not re–lock automatically; the user must press the* ***Keypad Lock*** *key to lock the Keypad.*

2.6.3 AUDIO TONE

There are five Incubator audio tones available. The factory default setting is Tone Number 3. During the selection process, the user is given an audible sample of each tone to aid in the selection of a tone. Refer to Paragraph 5.3.4 for Audio Tone Selection.

2.6.4 INCUBATOR NUMBER

The Incubator may be assigned a number from 01 to 99. The factory default setting is 01. This number is important when the Incubator has been connected to a remote monitor or printer via the **SERIAL PORT** located on the side panel. Refer to Paragraph 5.3.5 to select an Incubator Number.

2.6.5 RESTORING FACTORY DEFAULTS

The factory default settings are as follows:

- Air Mode.
- Air Set Temperature = 35 °C.
- Baby Set Temperature = 36.5 °C.
- Procedural Silence Time = 15 minutes.
- Keypad Lock Time Duration = 1 Minute.
- Incubator Number = 01.
- No External Interface (**SERIAL PORT** disabled).
- Audio Tone Number 3.

These may be restored by performing the procedure described in Paragraph 5.3.6.

Change 3

2.6.6 NO EXTERNAL INTERFACE

The **SERIAL PORT** located on the Incubator side panel may be disabled by performing the procedure described in Paragraph 5.3.7.

NOTE: *No External Interface is the factory default setting.*

2.6.7 CONFIGURING FOR A REMOTE MONITOR

The **SERIAL PORT** located on the Incubator side panel may be configured to communicate with a remote monitor. When configured to a remote monitor, the controller will provide the following data:

NOTE: *The protocol for the SERIAL PORT is provided in Section 3, Paragraph 3.4.3 Main Board, Serial Communications.*

- Heater Power.
- Incubator Number (refer to Paragraph 2.6.4).
- Air and Set Point Temperature (C500 will only provide Air Set Temperature) along with any changes.
- Current Air and Baby Temperature every 6 minutes (C500 will only provide Air Temperature).
- Any Alarm Messages that occur.
- Any changes to the Configuration Menu.
- Any change from Air Mode to Baby Mode or vice versa (C550 only).

Information is sent out as a data packet containing codes corresponding to alarms, status, etc. Each data packet begins with STX and ends with an ETX. In addition to the information, a transmission check sum is included.

A typical data packet is as follows:

InnA36.0? ***** = STX/ETX
? = Check sum of previous data bytes (not including check sum or ETX)

All packets begin with a "packet identifier" such as *Inn, which is translated as follows:
* STX
I Denotes "Incubator number" (set by user, (refer to Paragraph 2.6.4 above)
nn This is the actual 2–digit Incubator number set by the user (range = 0 to 99)

Following are the data packet identifier codes and their associated information which are transmitted either at synchronous or asynchronous rates. Synchronous data occur every 6 seconds and consist of a group of three packets of data: current Air Temperature, Baby Temperature and Heater Power. Asynchronous data are sent as they occur (example: an alarm is detected or a change in state, example: change from Air to Baby Mode). Synchronous data will continue to be sent unless a NEEDS SERVICE NOW message is present.

The current codes which are supported are listed below. Note that examples given are for selected Incubator number of 05.

CODE	NAME	TYPICAL PACKET	TRANSMISSION RATE
A	Air Temperature	*I05A36.0?*	Synchronous
B	Baby Temperature	*I05B34.5?*	Synchronous
C	Air Set Temperature	*I05C35.5?*	Asynchronous
D	Baby Set Temperature	*I05D36.4?*	Asynchronous
E	Heater Power	*I05E08?* (See Note 1)	Synchronous
G	Baby Mode Activated	*I05G?*	Asynchronous
F	Air Mode Activated	*I05F?*	Asynchronous
H	Alarm Detected	*I05H3?* (See Note 2)	Asynchronous
I	Alarm Acknowledged	*I05I?*	Asynchronous
J	Temp Override Active	*I05J?*	Asynchronous
K	Procedural Silence Activated	*I05K?*	Asynchronous
L	Procedural Silence Deactivated	*I05L?*	Asynchronous
Q	Alarm Cleared	*I05Q3?* (See Note 2)	Asynchronous
X	Needs Service Now	*I05X?* (See Note 3)	Asynchronous

NOTE 1: *The two digit heater power number (08 in the example above) denotes the number of segments lit at 10% of full heater power per segment (range = 00 to 10).*

NOTE 2: *The value following the "H" or "Q" code corresponds to the following alarm messages:*

0 – Air Temp Probe Fail
1 – High Temperature
2 – No Air Flow
3 – Air (or Baby) Temp Too Low (depends on current mode selected control)
4 – Air (or Baby) Temp Too High (depends on current mode selected control)
5 – Baby Temp Probe Fail

NOTE 3: *After this message is sent, RS232 communications will cease until the Incubator power is recycled.*

The **SERIAL PORT** may be configured to communicate with a remote monitor by performing the procedure described in Paragraph 5.3.8.

IMPORTANT: *When a remote monitor is connected to the* ***SERIAL PORT,*** *verify proper data transfer/duplication prior to use.*

2.6.8 CONFIGURING FOR A THERMAL PRINTER

The **SERIAL PORT** located on the Incubator side panel may be configured to communicate with a thermal printer. When configured to a thermal printer, the Controller will provide the following data:

- Incubator Number (refer to Paragraph 2.6.4).
- Air and Set Point Temperature (C500 will only provide Air Set Temperature) along with any changes.
- Current Air and Baby Temperature every 30 minutes (C500 will only provide Air Temperature).
- Any Alarm Messages that occur.
- Any changes to the Configuration Menu.
- Any change from Air Mode to Baby Mode or vice versa (C550 only).

All data will be transmitted in the current language selection (refer to Paragraph 2.6.11).

Change 2

The output transmission contains both synchronous and asynchronous data types.

Synchronous data are transmitted every 30 minutes and consist of a single transmission packet containing the current Air Temperature and current Baby Temperature. Asynchronous data are sent when something changes (mode change) or an alarm condition occurs.

The following table lists asynchronous events and the data transmission that follows. Please note that each transmission is prefaced with a series of control codes to the printer characteristics to select emphasized mode, double wide mode, and double strike mode as follows:

CCS (control codes sequence) = **ESCEESCW1ESCG**

ESC	(Escape)	27 (hex)
LF	(Line feed)	0A (hex)
CR	(Carriage Return)	0D (hex)

For the table below, xxx.x is the ASCII value of temperature. Example: 36.1 (if Degree C selected) of 101.8 (if Degree F selected). In addition, Y is the ASCII character "C" or "F" to denote either Degree C or Degree F mode.

ASYNCHRONOUS EVENT	TRANSMISSION DATA
Set Temperature Change	CCSET POINT: xxx.x **YLFLF**
Air Temperature Too High Alarm	**LF**CCAIR TEMP TOO HIGH**LFLF**
Change From Baby Mode	**CCS**BABY MODE**LFLF**CC/SSET POINT: xxx.x **YLFLF**
Baby Temp Too High Alarm	**LF**CCBABY TEMP HIGH**LFLF**
Baby Temp Too Low Alarm	**LF**CCBABY TEMP TOO LOW**LFLF**
Change from Baby to Air Mode	**CCS**AIR MODE**LFLF**CCSET POINT; xxx.x**YLFLF**
Needs Service Now Alarm	**CCS**NEEDS SERVICE NOW**LFLF**

The following lists the data transmission for a synchronous transmission of Air Temperature and Baby Temperature every 30 minutes. The transmission includes canceling emphasized mode, canceling double wide mode and selecting double strike mode.

ESCFESCWOESCGBABY TEMP = xxx.xY AIR TEMP = xxx.xY**LF**

Power–up information is transmitted when the Incubator Controller is initially energized. Note that this is the only time that the Incubator number will be transmitted. The following sequence is transmitted:

ESC@CRLF
CCSFACTORY DEFAULTS SET**LFLF**
CCS******************LFLF**
CCSC550/C500 VER 1.8**LFLF***
CCSINCUBATOR NUMBER=nn**LFLF**
CCSSELF TEST PASS**LFLF**
CCS*******************LFLF
ESCFESCWOESCBABY TEMP=xxx.xY AIR TEMP=xxx.xY**LFLF**
CCSAIR MODE **LFLF**
CCSSET POINT: xxx.xY**LFLF**

*SOFTWARE VERSION NUMBER OF YOUR CONTROLLER MAY DIFFER

The **SERIAL PORT** may be configured to communicate with a thermal printer by performing the procedure described in Paragraph 5.3.9.

***IMPORTANT:** When a printer is connected to the **SERIAL PORT,** verify proper data transfer/duplication prior to use.*

Change 2

2.6.9 CONFIGURING FOR A DOT MATRIX PRINTER

The **SERIAL PORT** located on the Incubator side panel may be configured to communicate with a dot matrix printer. When configured to a dot matrix printer, the Controller will provide the following data:

NOTE: *Baud Rate = 1200 —— 8 Data, 1 Stop Bit.*

- Incubator Number (refer to Paragraph 2.6.4).
- Air and Baby Set Point Temperature (C500 will only provide Air Set Temperature) along with any changes.
- Current Air and Baby Temperature every 30 minutes (C500 will only provide Air Temperature).
- Any Alarm Messages that occur.
- Any changes to the Configuration Menu.
- Any change from Air Mode to Baby Mode or vice versa (C550 only).

All data will be transmitted in the current language selection (refer to Paragraph 2.6.11).

The output transmission contains both synchronous and asynchronous data types.

Synchronous data are transmitted every 30 minutes and consist of a single transmission packet containing the current Air Temperature and current Baby Temperature. Asynchronous data are sent when something changes (mode change) or an alarm condition occurs.

The following table lists asynchronous events and the data transmission that follows. Please note that each transmission is prefaced with a series of control codes to the printer characteristics to select emphasized mode, double wide mode and double strike mode as follows:

CCS (control codes sequence) = **ESCEESCW1ESCG**

ESC	(Escape)	27 (hex)
LF	(Line feed)	0A (hex)
CR	(Carriage Return)	0D (hex)

For the table below, xxx.x is the ASCII value of temperature. Example 36.1 (if Degree C selected) of 101.8 (if Degree F selected). In addition, Y is the ASCII character "C" or "F" to denote either Degree C or Degree F mode.

ASYNCHRONOUS EVENT	**TRANSMISSION DATA**
Set Temperature Change	CCSET POINT: xxx.x **YLFLF**
Air Temperature Too High Alarm	**LF**CCAIR TEMP TOO HIGH**LFLF**
Change From Baby Mode	**CCS**BABY MODE**LFLF**CC/SSET POINT: xxx.x **YLFLF**
Baby Temp Too High Alarm	**LF**CCBABY TEMP HIGH**LFLF**
Baby Temp Too Low Alarm	**LF**CCBABY TEMP TOO LOW**LFLF**
Change from Baby to Air Mode	**CCS**AIR MODE**LFLF**CCSET POINT; xxx.x**YLFLF**
Needs Service Now Alarm	**CCS**NEEDS SERVICE NOW**LFLF**

The following lists the data transmission for a synchronous transmission of Air Temperature and Baby Temperature every 30 minutes. The transmission includes canceling emphasized mode, canceling double wide mode and selecting double strike mode.

ESCFESCWO ESCGBABY TEMP = xxx.xY AIR TEMP = xxx.x**YLF**

Change 2

Power–up information is transmitted when the incubator controller is initially energized. Note that this is the only time that the Incubator number will be transmitted. The following sequence is transmitted:

ESC@CRLF
CCSFACTORY DEFAULTS SET**LFLF**
CCS**********************LFLF**
CCSC550/C500 VER 1.8**LFLF***
CCSINCUBATOR NUMBER=nn**LFLF**
CCSSELF TEST PASS**LFLF**
CCS********************LFLF
ESCFESCWOESCBABY TEMP=xxx.xY AIR TEMP=xxx.x**YLFLF**
CCSAIR MODE **LFLF**
CCSSET POINT: xxx.x**YLFLF**

*SOFTWARE VERSION NUMBER OF YOUR CONTROLLER MAY DIFFER

The **SERIAL PORT** may be configured to communicate with a dot matrix printer by performing the procedure described in Paragraph 5.3.10.

IMPORTANT: *When a printer is connected to the* ***SERIAL PORT,*** *verify proper data transfer/duplication prior to use.*

2.6.10 DISABLING THE BABY MODE FUNCTION (C550 CONTROLLERS ONLY)

The Baby Mode function may be disabled on C550 Controllers; to disable the Baby Mode function, perform the procedure described in Paragraph 5.3.11.

IMPORTANT: *When the Baby Mode Function of the C550 Controller has been disabled, and any Baby Mode key is pressed, the Message Center will display the message CONFIGURATION ERROR.*

2.6.11 LANGUAGE SELECTION

The Controller Message Center has the capability to present messages in several different languages. These languages include English, French, Spanish, Italian, and German. Alternatively, English, Japanese, Swedish and Russian are also available. To select a language, perform the procedure described in Paragraph 5.3.12.

2.7 OPERATIONAL CHECKOUT PROCEDURE

The Operational Checkout should be performed before the Incubator is first placed into service and after any disassembly for cleaning or maintenance.

2.7.1 CHECKING THE POWER FAILURE ALARM AND CONNECTING THE INCUBATOR TO THE AC LINE

WARNING: The Incubator should not be used if it fails to function as described. Service should be referred to qualified personnel.

CAUTION: Make sure that the building power source is compatible with the electrical specifications shown on the right side of the Incubator and VHA Stand. For proper grounding reliability, connect the power cord only to a properly marked 3–wire hospital–grade or hospital–use receptacle. Do not use extension cords.

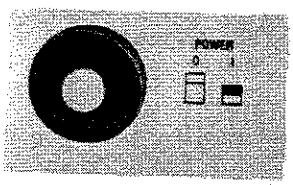
Observe the following CAUTIONS when the Incubator is mounted on a VHA Stand:

CAUTION: HEAVY EQUIPMENT – To prevent injury or damage to the Incubator/Stand when transporting, use two persons of sufficient strength to adequately control the Incubator.

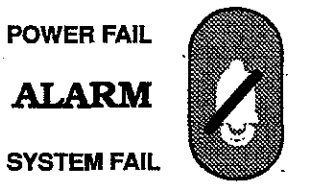
CAUTION: Always lower the Incubator to its lowest position prior to transport for optimum stability.

IMPORTANT: *Before attempting to perform this procedure, refer to the Operator's Manual, Paragraph 4.1,* ***CONTROLS AND INDICATORS,*** *and Service Manual, Paragraph 3.2, The Controller Message Center.*

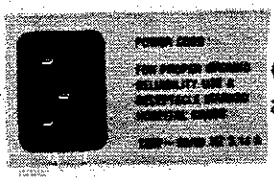
A. CHECK THE POWER FAILURE ALARM



BEFORE CONNECTING THE INCUBATOR to the power source, press the **POWER** switch; the power failure alarm should sound and the **POWER FAIL** Indicator on the Controller should light. This tests the operation of the power failure alarm circuit. Press the **POWER** switch a second time to silence the alarm.

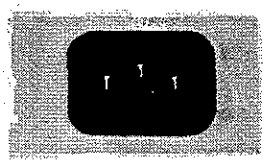


B. CONNECT THE AC POWER CORD AND APPLY POWER

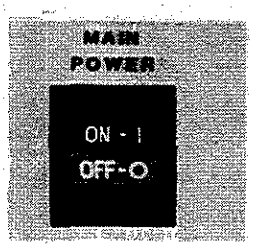


CONNECT THE AC POWER CORD directly to the Incubator when mounted on a Standard Cabinet Stand

OR

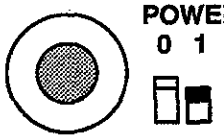


CONNECT THE AC POWER CORD to the VHA Stand ac power outlet when the Incubator is mounted on a VHA Stand (Option). The Incubator power cord should be connected to the VHA Stand receptacle to prevent accidental disconnection or damage when the Incubator is raised or lowered.



DEPRESS THE POWER SWITCH ON THE VHA STAND

AND/OR



DEPRESS THE POWER SWITCH ON THE INCUBATOR. When ON, the switch is illuminated. When initially turned on, the unit performs a self–test. All indicator lamps light, the audible alarm is pulsed, the digital displays show eights (88.8) and the Message Center will display SETTING DEFAULTS and then SELF–TEST RUNNING. If the unit fails the self–test, the message NEEDS SERVICE NOW will appear. Refer the unit to service. Otherwise, refer to the Operator' s Manual, Paragraph 4.4, Setting the Air Set Temperature, and set the Air Set Temperature to 34 °C.

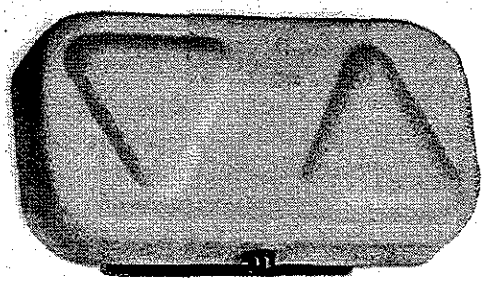
C. ALLOW THE UNIT TO OPERATE WHILE PERFORMING THE HOOD/SHELL CHECKS

2.7.2 OPERATIONAL CHECKOUT – HOOD/SHELL AND VHA STAND, IF SO EQUIPPED

WARNING: The incubator should not be used if it fails to function as described. Service should be referred to qualified personnel.

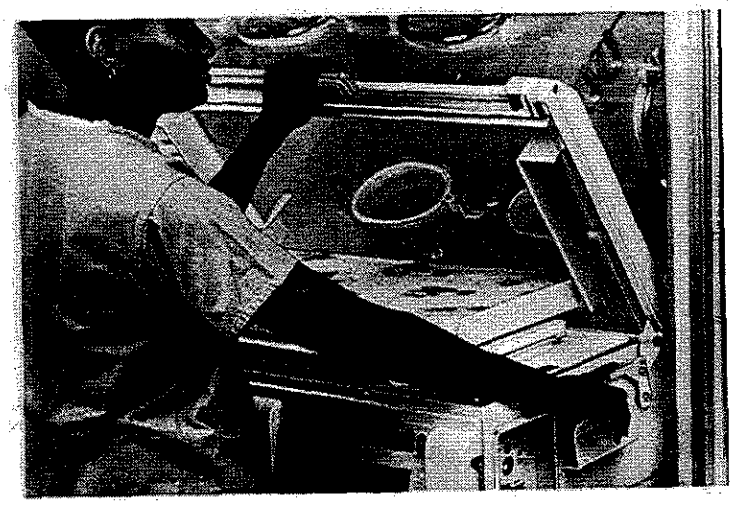
Perform this Operational Checkout Procedure along with the Operational Checkout Procedure provided for the Controller before first placing the Incubator into service and after any disassembly or maintenance.

A.CHECK THE VHA STAND IF SO EQUIPPED



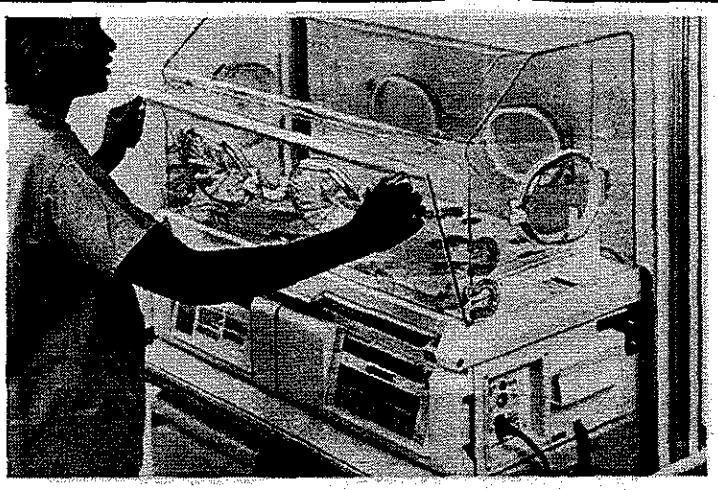
Turn on the Main Power switch. Use foot to press the right portion of the VHA Stand Up/Down switch to raise the stand to the maximum height. Press and hold the left portion of the VHA Stand Up/Down Switch to lower the stand to the minimum height. Verify the stand operates smoothly and readjust to desired height.

B.CHECK THE HOOD HINGE AND LATCH OPERATION



Using the Hood Lift handle, slowly tilt the Hood back until the Hood Latch engages. Close the Hood by releasing the Hood Latch.

C. CHECK THE ACCESS PANEL DETENT AND INCUBATOR NOISE LEVEL



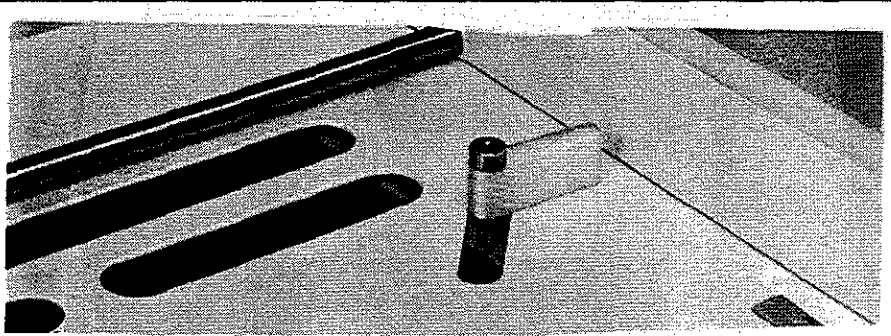
Rotate both latch/releases inward and open the Access Panel; the Air Curtain Cover should rise slightly as the Access Panel opens, and the detents should create a noticeable "drag" during initial movement of the panel. Pivot the Access Panel to the full open position (hanging straight down). Listen inside the Patient Compartment to confirm no unusual sounds (Fan Motor/Impeller Noises) are present.

D. CHECK THE AIR CURTAIN COVER

Remove Mattress Tray by lifting it straight up to clear the rails on the hood baffles and then withdrawing it through the front of the Incubator. Check that the rear curved edge of the Air Curtain Cover is retained by the 1/4–inch rod between the Mattress Tray rails and that the front edge is about 1 inch above the Main Deck.

E. CHECK THE MAIN DECK

WARNING: Do not lift the main deck or touch the heater when performing the following step. The heater can be sufficiently hot to cause burns.

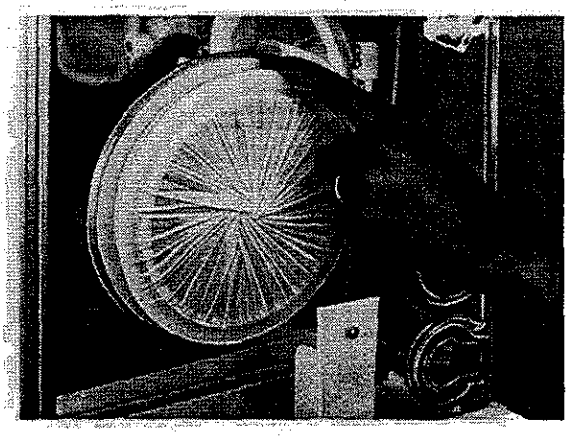


Pivot the Air Curtain Cover to the vertical position and check the Main Deck Retainer; position the retainer as shown. Lower the Air Curtain Cover and reinstall the Mattress Tray.

WARNING: The air curtain cover must be properly installed for correct temperature control.

F. CHECK THE IRIS ENTRY PORTS

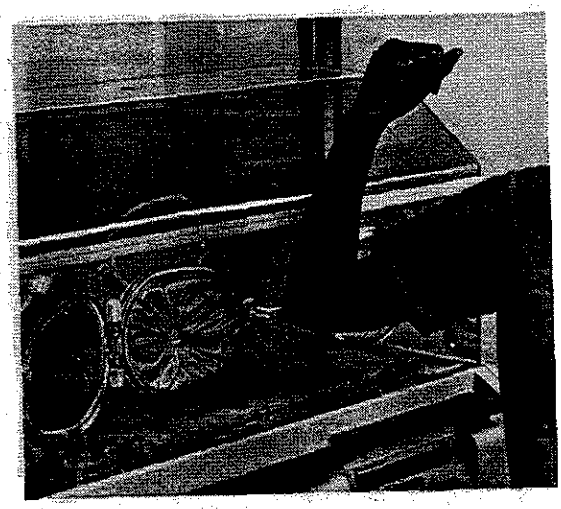
Rotate the outer ring of the Iris Port(s); the iris should open and close as rotation is continued through 360 degrees.



G. CHECK THE ACCESS PANEL LATCHES

Close the Access Panel and rotate both latches until fully engaged. Make sure both latches are fully engaged to avoid accidental opening of the Access Panel.

H. CHECK THE ACCESS DOOR LATCH

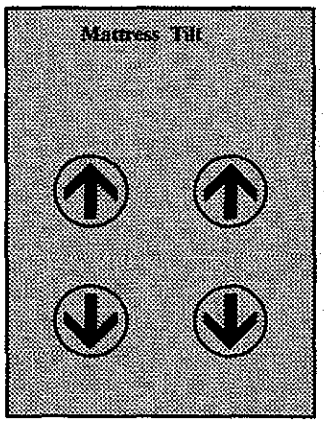


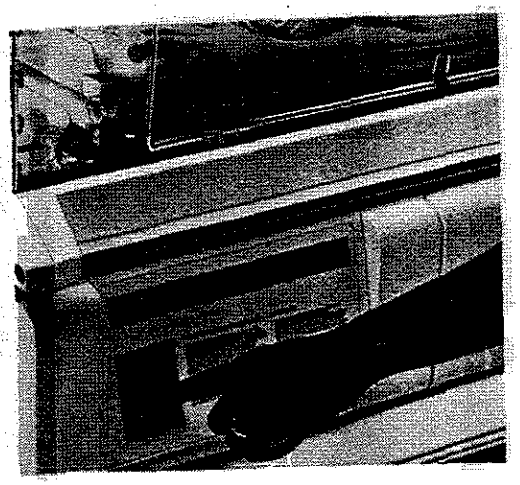
Press the door release of each Access Door simultaneously. Each Access Door should swing open. Close the doors and check for proper latching and quietness.

I. CHECK THE MATTRESS ELEVATORS

IMPORTANT: *The Elevators permit positioning the infant in the Trendelenburg or Reverse Trendelnburg position. Do not elevate both ends of the mattress at the same time except for possible use during magnification X–ray procedures. Never leave the infant unattended while both elevators are raised.*

PNEUMATIC TILT





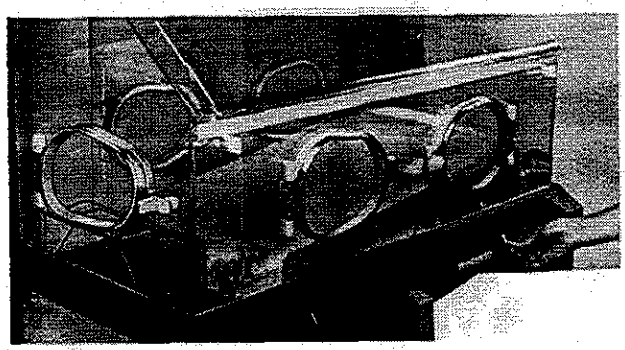
Press and hold the right–hand **up arrow** to raise the Mattress until it stops. The right end of the Mattress should be at a 9° angle. Press and hold the right–hand **down arrow** until the Mattress stops. The Mattress should be level. Repeat the procedure using the left–hand **up** and **down arrows.**

NOTE: *The Mattress Elevators will be inoperative if the DISS fitting located on the rear panel of the Shell is not connected to an active source of wall air. Refer to the Controls and Indicators, Paragraph 4.1.4, and Section 2, Installation, for details. If a source of wall air is not available or in the event of a pneumatics related failure, the Manual Override of Pneumatic Tilt procedure described below should be employed.*

MANUAL OVERRIDE OF PNEUMATIC TILT

1. Deflate the Bellows until the mattress is level.
2. Grasp the left Stabilizer Bar and raise the Mattress Tray Holder up and lock it in place by attaching the Lock–Up Clip to the Pin on the front Stabilizer Bar Retainer. To release the tray, push the Stabilizer Bar forward and then gently lower it. Raise the right side of the mattress Tray and lock it in place with the Lock–Up Clip. Release the tray and gently lower it.

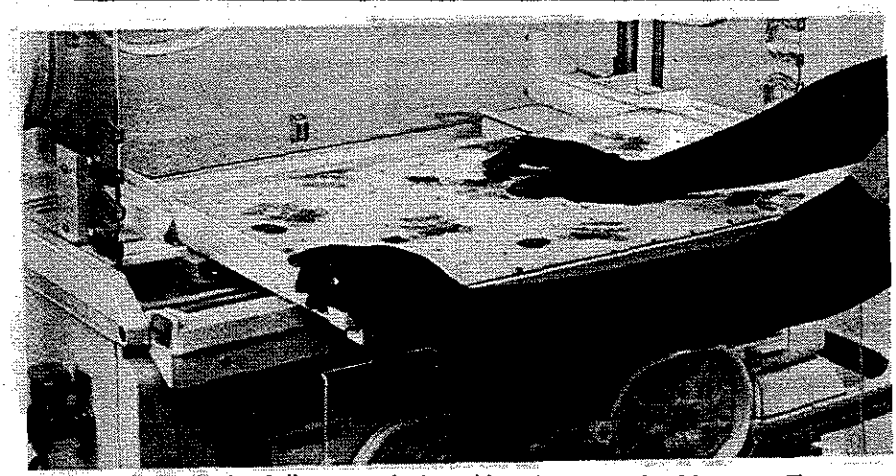
MANUAL TILT (IF SO EQUIPPED)



Rotate the right mattress tilt mechanism handle clockwise until it stops. The right end of the mattress should be at a 9° angle. Rotate the handle counterclockwise until it stops. The mattress should be level. Repeat the procedure using the left mattress handle.

Change 2

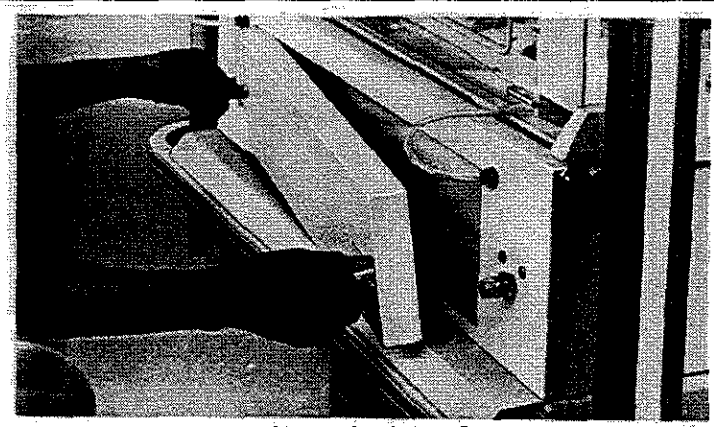
J. CHECK MATTRESS TRAY OPERATION



Slide out the Mattress Tray to the fully extended position. Lean on the Mattress Tray to make sure it is properly supported to provide a firm infant platform.

K. CHECK THE AIR INTAKE MICROFILTER

WARNING: A dirty Air Intake Microfilter may affect oxygen concentrations and/or cause carbon dioxide build–up. Check filter on a routine basis and change at least every three months.



Loosen the two thumbscrews of the Air Intake Filter Cover and remove the cover. Inspect the microfilter; if visibly dirty, replace it. Refer to Section 4, Cleaning and Maintenance, for additional instructions.

Change 2

L. CHECK THE OXYGEN INPUT VALVE FILTER

Check the oxygen Input Valve Filter Cartridge once every four months and replace it if the ends are gray or black. Refer to the Service Manual and qualified service personnel.

M. CHECK THE AIR/OXYGEN SYSTEM

Introduce a carefully measured 8 lpm of oxygen into the Oxygen Input Valve, then monitor levels within hood to verify that they reach the predicted level as indicated on the Filter Cover Assembly.

2.7.3 OPERATIONAL CHECKOUT – CONTROLLER

WARNING: The Incubator should not be used if it fails to function as described. Service should be referred to qualified personnel.

IMPORTANT: *Before attempting to perform this procedure, refer to Operator's Manual, Paragraph 4.1,* ***CONTROLS AND INDICATORS,*** *and Service Manual, Paragraph 3.2,* ***THE CONTROLLER MESSAGE CENTER.***

IMPORTANT: *If the ambient temperature is 17.5 °C or lower, the air temperature and baby temperature displays will be blank until the ambient temperature rises above 17.5 °C. If the ambient temperature is 15.5 °C or lower, the alarm message "NEEDS SERVICE NOW" will appear in the Message Center and the audible alarm will sound until the ambient temperature rises above 15.5 °C and the unit is turned off, then on.*

Perform this Operational Checkout Procedure along with the Operational Checkout Procedure provided for the Hood/Shell before first placing the Incubator into service and after any disassembly or maintenance.

A. CHECK THE AIR CONTROL MODE OF OPERATION

With all access openings closed, allow the Incubator to warm up to the **Air Set Temperature** (33 °C); it should take less than one hour. While the unit is warming up, suspend the Auxiliary Probe through the hole in the top of the Incubator Hood and position the patient probe on the center of the mattress surface. **Do not connect the probe plugs to the receptacles.** When the **Air Temperature °C/°F** Display has stabilized, the number of **Heater Power %** Indicator lamps illuminated will typically be reduced to no more than six. Check that the digital display remains within 0.5 °C of Set Temperature for 15 minutes after stabilization.

B. CHECK THE AIR SET TEMPERATURE ALARM

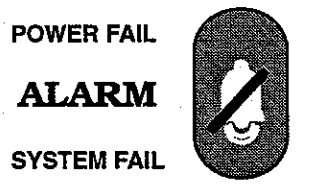
Refer to the Operator's Manual, Paragraph 4.4, Setting the Air Set Temperature, and set the Set Temperature to 31 °C. The Message Center should display SET POINT UPDATED, then AIR TEMP TOO HIGH, followed by the message ALARM SILENCED. In addition, the **ALARM** Indicator should be on. In approximately four minutes the audible alarm should sound.

Change the Set Temperature to 37 °C; the current alarm should cancel. The Message Center should display SET POINT UPDATED, then AIR TEMP TOO LOW, followed by the message ALARM SILENCED. In addition, the **ALARM** Indicator should be on. In approximately eight minutes the audible alarm should sound. Return the Set Temperature to 33 °C.

Air Set Temperature

Set Point Display

Set Point Display

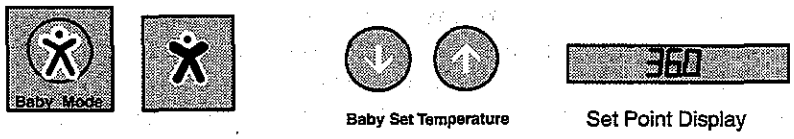


C. CHECK THE AIR AUXILIARY PROBE

Insert the Auxiliary Probe connector into the AIR AUXILIARY PROBE receptacle. When the **Air Temperature °C/°F** Display has stabilized, no more than six **Heater Power %** Indicator lamps will typically be lit. Check that the digital display remains within 0.5 °C of Set Temperature for 15 minutes after stabilization.

D. CHECK THE BABY CONTROL MODE OF OPERATION

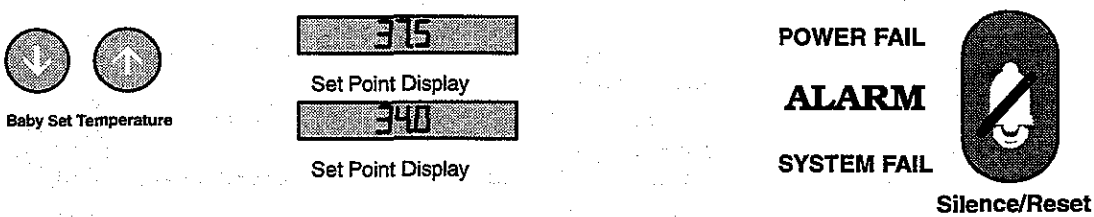
Connect the Patient Probe plug to the **PATIENT PROBE** receptacle and select the **Baby Mode** of operation. Refer to the Operator's Manual, Paragraph 4.3, and set the Baby Set Temperature to 36 °C. Locate the sensor to control air temperature above center mattress. If the set point alarm starts, depress the **Silence/Reset** Key. When the **Skin Temperature °C/°F** Display has stabilized, the number of **Heater Power %** Indicator lamps illuminated will typically be reduced to no more than six. Check that the digital display remains within 0.5 °C of Set Temperature for 15 minutes after stabilization.



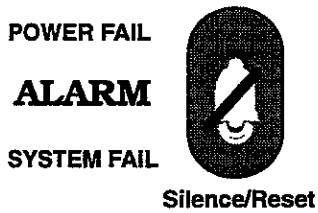
E. CHECK THE BABY SET TEMPERATURE ALARM

Allow Incubator temperature to stabilize at 36 °C. Refer to the Operator's Manual, Paragraph 4.3, Setting the Baby Set Temperature, and set the Set Temperature to 37.5 °C. The Message Center should display SET POINT UPDATED, then BABY TEMP TOO LOW, followed by the message ALARM SILENCED. In addition, the **ALARM** Indicator should be on.

Change the Set Temperature to 34.0 °C; the current alarm should cancel. The Message Center should display SET POINT UPDATED, then BABY TEMP TOO HIGH, followed by the message ALARM SILENCED. In addition, the **ALARM** Indicator should be on. In approximately four minutes the audible alarm should sound. Return the Set Temperature to 36 °C.



F. CHECK THE BABY TEMP PROBE FAIL ALARM



Disconnect the Patient Probe from the receptacle. The audible and visual alarms should activate, the **Baby Temperature °C/°F** Display should blank, and the **Heater Power %** Indicator lamps should all go off. When the Skin Probe is reconnected, the Incubator should return to normal operation after the **Silence/Reset** Key is pressed.

G. CHECK THE AIR FLOW ALARM

Set the **POWER** switch to OFF. Remove the Controller from the Incubator. Remove the fan impeller from the fan motor shaft and reinstall the Controller in the Incubator. Reinsert the temperature probes. Set the **POWER** switch to ON and wait for the end of the self–test cycle. Within 5 minutes, the NO AIR FLOW message should appear, an audible alarm should sound, and all **Heater Power %** lights should go out. Reinstall the fan impeller and restore the Incubator to normal operating condition before proceeding.

CAUTION: The Heater will be hot; avoid touching it.

H. CHECK THE MAXIMUM AIR TEMPERATURE

Select the **Baby Mode** of operation. Position the probe end of the Patient Probe outside the Incubator. Allow the Incubator to heat. If the BABY TEMP TOO LOW message appears and the alarm actuates, depress the **Silence/Reset** Key.

The Incubator should not heat above 37.5 °C ± 0.4 °C **(Software Level 1.8 or higher with a US Designation, the temperature will be limited to 39.5 ± 0.5 °C)**, as indicated on the **Air Temperature °C/°F** Display.

I. THE OPERATIONAL CHECKOUT IS COMPLETE

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SECTION 3
TECHNICAL INFORMATION

3.1 SPECIFICATIONS

Specifications for the Isolette® Infant Incubators, Models C500 QT® and C550 QT®, are provided in Table 3.1. All specifications are subject to change without notice.

TABLE 3.1 SPECIFICATIONS

Power Requirements:

Models C500 QT® and C550 QT® ..... 120V ± 10%, 50/60 Hz, 500 W Max
100V ± 10%, 50/60 Hz, 500 W Max
220V ± 10%, 50/60 Hz, 500 W Max

Chassis Leakage Current,100/120V Units ..... less than 100 µA
220V Units ..... less than 500 µA

Alarms:

No Air Flow ..... Activated by fan failure or a failed (broken) Air Flow Sensor

Air Temp Probe ..... Activated by a failed Air Temperature or Auxiliary Probe

Baby Temp Probe (C550 QT® only) ..... Activated by a failed Baby Temperature Probe or if probe is disconnected from unit when operating in Baby Mode.

Needs Service Now ..... Activated by following conditions:
Failed Air Flow probe,
Failed High Temperature Probe,
Internally detected Failures.

High Temperature ..... Activated if displayed temperature exceeds
39 ± 0.3 °C **(Software Level 1.8 or Higher with a US Designation)**
All other units
39 ± 0.3 °C for set temps >37 °C
or 37 ± 0.3 °C for set temps <37 °C

System Fail ..... System failure, refer unit to service

AIR or BABY TEMP TOO HIGH or TEMP TOO LOW ..... Activates if Baby* or Air Temperature fluctuates from set temperature as follows:

In Baby Mode*–Baby Temperature ..... +1.0 ± 0.3 °C
–1.0 ± 0.3 °C

In Air Mode–Air Temperature ..... +1.5 ± 0.5 °C
–2.5 ± 0.5 °C

Power Failure Alarm (**Power Fail**) ..... Activates if primary power to the incubator fails or the power cord is accidentally disconnected from the wall receptacle.

*Model C550 QT® only.

Change 2

TABLE 3.1 SPECIFICATIONS (Cont.)

Alarms (Continued)
Silence/Reset:

Silence ..... Can silence all alarms, including Power Failure Alarm; silences the TEMP TOO HIGH or LOW audible alarm for 15 minutes; alarm silence is automatically overridden if a subsequent alarm occurs within the period of silence.

Reset ..... Cancels High Air Temperature Air Flow or Probe Alarm if alarm condition no longer exists.

Audible Alarm Level ..... 65 dBA minimum at a point 3 meters away 1.5 meters above floor

Audible Alarm Frequency ..... Tone 1–1000 Hz nominal
Tone 2–1100 Hz nominal
Tone 3–1250 Hz nominal
Tone 4–1400 Hz nominal
Tone 5–1600 Hz nominal

Temperature Control Ranges:
Air Control Mode ..... 20.0 to 39.0 °C
Baby Control Mode* ..... 34.0 to 37.9 °C
Temperature Rise Time** ..... 60 minutes
Temperature Variation** ..... within ≤ 0.2 °C
Temperature Overshoot** ..... 0.5 °C maximum
Temperature Uniformity** ..... within 1.0 °C
Correlation of Indicated Air Temperature to Actual Incubator Temperature**
(after **Steady Temperature Condition**** is reached) ..... ± 0.8 °C
Temperature Control Accuracy
Air ..... ± 0.5 °C of set temperature up to 39.0 °C
Baby* ..... ± 0.3 °C of set temperature up to 38.0 °C
Oxygen Concentration Range ..... Ambient to >95%
CO_2 Concentration within the Baby Compartment ..... >0.3%
Humidity (with no supplemental Oxygen being administered and Set Temperature >32 °C and ambient temperature 20–30 °C) 50–60%
Environmental:
Ambient Operating Range ..... 68 °F (20 °C) to 86 °F (30 °C)
Ambient Storage Range ..... –23 °F (–30 °C) +158 °F (+70 °C)
Humidity ..... 5% RH to 95% RH (non–condensing)

*Model C550 QT® only.
**Refer to Table of Definitions and Symbols.

TABLE 3.1 SPECIFICATIONS (Cont.)

Nominal Dimensions:

Height from Floor C500/C550 QT®	141 cm (55.5")
Height from Floor C500/C550 QT® Model XL	140 cm (55")
Depth	59.44 cm (23.4")
Width	119.4 cm (47.0")

Nominal Weight (without Accessories and Standard Cabinet Stand) ..... 86 kg (190 lbs)

Mattress Tilt

Trendelenburg/Reverse Trendelenburg ..... Level ± 9°
Continuously Variable

Noise Level within Hood Environment ..... < 55 dBA maximum with 45 dBA or less ambient

Air Velocity over Mattress ..... Does not exceed 10 cm/sec (20 ft/min) within **Control Zone.****

VHA (Vertical Height Adjustable) STAND – Optional

Power Requirements (including Incubator)	120V, ± 10%, 60 Hz, 600 W, Nominal 220–240V, ± 10%, 50/60 Hz, 600 W, Nominal
Chassis Leakage Current (including Incubator) 120V units	less than 100 µA
Chassis Leakage Current (including Incubator) 220V – 240V units	less than 500 µA

Height Range (VHA Stand)

Low	60.3 cm (23.75")
High	81.9 cm (32.25")
Depth	53.3 cm (21.00")
Width	113 cm (44.50")
Weight	95.2 kg (210 lbs)
Height Range (Incubator Mattress)	
Low	87.6 cm (34.50")
High	109 cm (43.00")
Weight (with Incubator mounted)	140.6 kg (310 lbs)

Change 5

3.2 THE CONTROLLER MESSAGE CENTER

3.2.1 ALPHABETICAL LISTING OF ALARM, SYSTEM AND USER PROMPT MESSAGES ALONG WITH PAGE NUMBERS

3.2.2 ALARM MESSAGES

The alarm messages that will appear in the TWENTY–CHARACTER MESSAGE CENTER are presented below. In the event that two or more alarms occur simultaneously, or one after the other, the messages that describe the alarms will be presented in an alternating sequence.

ALARM MESSAGE	DESCRIPTION
NEEDS SERVICE NOW	This message is displayed along with a continuous audible alarm to indicate that the Incubator has experienced a malfunction. Refer to Paragraph 5.6, Troubleshooting.
HIGH TEMPERATURE	This message is displayed along with an audible alarm to indicate that Incubator air temperature has reached 38.0 °C (40.0 °C for >37 °C Mode) (40.0 °C for 1.8 software or higher with U.S. designation). This alarm is not self–resetting, but can be silenced by the **Silence/Reset** key for a period of 5 minutes.
NO AIR FLOW	This message is displayed along with an audible alarm to indicate fan failure or short–circuited air flow sensor. This alarm is not self–resetting but can be silenced or by the **Silence/Reset** key for a period of 5 minutes.
AIR TEMP PROBE FAIL	This message is displayed along with a two–tone audible alarm to indicate a malfunctioning air temperature probe. This alarm is not self–resetting but can be silenced or reset by the **Silence/Reset** key.
BABY TEMP PROBE FAIL	This message is displayed along with a two–tone audible alarm to indicate a malfunctioning baby temperature probe. This alarm is not self–resetting but can be silenced or reset by the **Silence/Reset** key. This alarm is also actuated if the baby temperature probe is disconnected while in BABY MODE.
Change 4	***NOTE:*** *This Message applies to the C550 QT® only.*

ALARM MESSAGE	DESCRIPTION
BABY TEMP TOO HIGH	**BABY MODE** – This message is displayed along with a two–tone audible alarm to indicate that the baby's skin temperature is 1°C above the Baby Set Temperature. ***NOTE:*** *This message appears on the C550 only.*
AIR TEMP TOO HIGH	**AIR MODE** – This message is displayed along with a two–tone audible alarm to indicate that the Incubator air temperature is 1.5 °C above the Air Set Temperature.
BABY TEMP TOO LOW	**BABY MODE** – This message is displayed along with a two–tone audible alarm to indicate that the baby's skin temperature is 1 °C below the Baby Set Temperature. ***NOTE:*** *This message appears on the C550 only.*
AIR TEMP TOO LOW	**AIR MODE** – This message is displayed along with a two–tone audible alarm to indicate that the Incubator air temperature is 2.5 °C below the Air Set Temperature. **BABY MODE** – This message will also appear while operating in Baby Temperature Mode, if an Auxiliary Probe at room temperature is placed into a "warm" Incubator.

IMPORTANT NOTES ON TEMP TOO HIGH AND TEMP TOO LOW ALARMS

NOTE: *The Air and Baby Temperature Too High and Temperature Too Low Alarms are self–resetting; that is, if the alarm condition is corrected, the visual and audible alarms are automatically silenced and the Message Center is cleared.*

NOTE: *To silence the audible portion of the Air and Baby Temperature Too High and Temperature Too Low Alarms for 10 minutes, press the* ***Silence/Reset*** *key; the activation of other audible and visual alarms will not be affected during this silence period.*

NOTE: *The Air and Baby Temperature Too Low Alarms are disabled for up to 60 minutes after the unit is turned on. The Incubator should reach Set Point Temperature within the 60–minute time span; the alarm is automatically enabled. If the Incubator has failed to reach Set Point Temperature within 60 minutes, the alarm will sound.*

NOTE: *In addition, the Air and Baby Temperature Too High and Temperature Too Low Alarms are silenced for a specific amount of time after the operator raises or lowers the Baby Set Temperature or the Air Set Temperature from a current Incubator temperature. The time that the alarms remain silenced varies with the amount of change (either plus or minus) from the current Incubator temperature. As a general rule, the greater the change from the current Incubator temperature, the longer the alarms will remain silenced. If the Incubator fails to reach the new set temperature after the specified time, the alarm will sound. Refer to Section 3, Figure 3.3, for specific times the alarms are silenced versus the amount of change from the current Incubator temperature.*

Change 1

ALARM MESSAGE	DESCRIPTION
ALARM ACKNOWLEDGED	This message indicates that the **Silence/Reset** key has been pressed in response to an alarm condition.
ALARM SILENCED	This message appears after the message that describes an active alarm that has been silenced by pressing the **Silence/Reset** key. It also appears during Procedural Silence or when the operator has changed the Baby Set Temperature or the Air Set Temperature from a current operating temperature.
PROCEDURAL SILENCE	This message indicates that the user has pressed the **Silence/Reset** key to start the Procedural Silence timer. Procedural Silence can last up to 15 minutes. During this period, alarms inadvertently caused by routine procedures will be silenced automatically. To stop the Procedural Silence Timer, press the **Silence/Reset** key again. ***NOTE:*** *The Procedural Silence time is factory–set for 15 minutes. Refer to Section 5, Paragraph 5.3.2, for a procedure to change the Procedural Silence time.*

3.2.3 SYSTEM AND USER PROMPT MESSAGES

The following System and User Prompt Messages that will appear in the TWENTY–CHARACTER MESSAGE CENTER are presented below:

SYSTEM/USER PROMPT MESSAGE	DESCRIPTION
SELF–TEST RUNNING	This message appears when the unit is turned on. In addition, all Indicators are on, all segments of the Digital Displays are lit and the audible alarm sounds. ***NOTE:*** *If during the Self–Test any Indicators fail to come on, any segments of the Digital Displays fail to light, or the audible alarm does not sound, refer the unit to qualified service personnel.*
SELF–TEST PASS	This message appears after the Incubator has completed the Self–Test program.
AIR MODE	This message indicates that the Incubator is operating in the Air Temperature Mode.
BABY MODE	This message indicates that the Incubator is operating in the Baby Temperature Mode. ***Note:*** *This message will only appear on C550 Controllers.*
KEYPAD IS LOCKED	This message appears when the following keys are pressed: **>37°, Baby Set Temperature, Baby Mode, Air Mode, Air Set Temperature** and **°C/°F** and the Keypad is locked. When the Keypad is locked, the **Lock Symbol** over the **Keypad Lock** key will be lit. This message will also appear when the Keypad is unlocked and the user presses the **Keypad Lock** key to lock the Keypad or the Keypad Lock Time Duration (this may be up to 10 minutes after the last Keypad key was pressed) has timed out. ***NOTE:*** *The Keypad Lock Time Duration is factory–set for a period of 10 minutes. Refer to Section 5, Paragraph 5.3.3, for a procedure to set the Keypad Lock Time.* ***NOTE:*** *The* ***Timer Set/Reset, Start/Stop*** *and* ***Silence/Reset*** *keys are never locked.*

SYSTEM/USER PROMPT MESSAGE	DESCRIPTION
KEYPAD IS UNLOCKED	This message appears when the **Keypad Lock** key is pressed and the Keypad is unlocked. When the Keypad is unlocked, the **Lock Symbol** over the key will be off. The following keys become operative when the Keypad is unlocked: **>37°, Baby Set Temperature, Baby Mode, Air Mode, Air Set Temperature,** and **°C/°F.** The Keypad will remain unlocked until the **Keypad Lock** key is pressed or for up to 10 minutes after the last Keypad key was pressed. ***NOTE:*** *The Keypad Lock Time Duration is factory–set for a period of 10 minutes. Refer to Section 5, Paragraph 5.3.3 for a procedure to set the Keypad Lock Time Duration.* ***NOTE:*** *The >37° key will not become operative until the Baby Set Temperature or the Air Set Temperature has been set to 37°C. When the >37° key is selected, the >37° Symbol over the >37° key illuminates.*
SET POINT UPDATED	This message appears within 3 seconds after the Air or Baby Set Temperatures have been changed from a current operating temperature. Updating the set temperatures causes the Air or Baby Temperature Too High and Temperature Too Low Alarms to be silenced for a specific amount of time after the operator raises or lowers the **Baby Set Temperature** or the **Air Set Temperature** from a current operating temperature. The time the alarms remain silenced varies with the amount of change (either plus or minus) from the Incubator temperature. As a general rule, the greater the change in tenths of a degree from the current Incubator temperature, the longer the alarms will remain silenced. If the Incubator fails to reach the new set temperature after the specified time, the alarm will sound. Refer to Section 3, Figure 3.3, for specific times the alarms are silenced versus the amount of change from the current Incubator temperature.
CAUTION: TEMP > 37	This message appears when the **>37°** key is pressed to place the Incubator in the Temperature Override Mode of operation. **Baby Mode** 37 °C (98.6 °F) to 38 °C (100.4 °F) or **Air Mode** 37 °C (98.6 °F) to 39 °C (102.2 °F). ***NOTE:*** *The >37° key will not become operative until the Baby Set Temperature or the Air Set Temperature has been set to 37°C. When the >37° key is selected, the >37° Symbol over the key illuminates.*

Change 5

SYSTEM/USER PROMPT MESSAGE	DESCRIPTION
CELSIUS SELECTED	This message appears after the **°C/°F** key is pressed to change the **Baby Temperature °C/°F**, **Air Temperature °C/°F**, Baby Set temperature and Air Set Temperature displayed temperatures from Fahrenheit to Celsius.
FAHRENHEIT SELECTED	This message appears after the **°C/°F** key is pressed to change the **Baby Temperature °C/°F**, **Air Temperature °C/°F**, Baby Set temperature and Air Set Temperature displayed temperatures from Celsius to Fahrenheit.
TIMER ACTIVE	This message appears after the **Timer Start/Stop** key is pressed to start the Timer. It indicates that the Timer is running. Refer to the Operator's Manual, Section 4, Paragraph 4.5, Operating the Timer.
TIMER PAUSED	This message appears after the **Timer Start/Stop** key is pressed to stop the timer. It indicates that the Timer has stopped running. Refer to Operator's Manual, Section 4, Paragraph 4.5, Operating the Timer.
SETTING THE TIMER	This message appears when the operator is selecting a time. Refer to Operator's Manual, Section 4, Paragraph 4.5, Operating the Timer.
TIMER RESET	This message appears after the operator has pressed the **Timer Set/Reset** key to reset the Timer to zero. Refer to the Operator's Manual, Section 4, Paragraph 4.5, Operating the Timer.
TIME ELAPSED	This message appears after the Timer has counted down to 0 minutes or counted up to the minimum elapsed time. Refer to the Operator's Manual, Section 4, Paragraph 4.5, Operating the Timer.
DIAGNOSTICS	This message informs the operator that the Diagnostic Menu has been selected by simultaneously pressing the **>37°** and **°C/°F** keys during the SELF–TEST RUNNING message. Refer to Section 5, Paragraph 5.2, to select the Diagnostic Menu items.
CONFIGURATION C/F	This message informs the operator that the Configuration Menu has been selected from the main Diagnostic Menu. This message appears after the operator has selected the Diagnostic Menu by simultaneously pressing the **>37°** and **°C/°F** keys during the SELF–TEST RUNNING message. Refer to Section 5 for an explanation and a procedure to select the Configuration Menu.

SYSTEM/USER PROMPT MESSAGE	DESCRIPTION
PROC SIL TIME C/F **(PROCEDURE SILENCE TIME)**	This message informs the operator that the Procedural Silence Time Menu has been selected from the Configuration Menu. Refer to Section 2, Paragraph 2.6.1, and Section 5, Paragraph 5.3.2, for an explanation and a procedure to select the Procedural Time Duration.
PROC SIL MINUTES = 15 **(PROCEDURE SILENCE MINUTES = 15)**	This message appears in the Procedural Time Menu and prompts the operator to select a procedural silence time from 0 to 15 minutes by using the **Baby Set Temperature** or **Air Set Temperature** Up/Down Arrow keys. Refer to Section 2, Paragraph 2.6.1, and Section 5, Paragraph 5.3.2, for an explanation and a procedure to select the Procedural Time Duration.
KEYPD LOCK TIME C/F **(KEYPAD LOCK TIME)**	This message informs the operator that the Keypad Lock Time Menu has been selected from the Configuration Menu. Refer to Section 2, Paragraph 2.6.2, and Section 5, Paragraph 5.3.3, for an explanation and a procedure to select the Keypad Time–to–Lock duration.
KEY LOCK TIME = 10	This message appears in the Keypad Time–to–Lock Menu and prompts the operator to select a Keypad Time–to–Lock from 0 to 10 minutes by using the **Baby Set Temperature** or **Air Set Temperature** Up/Down Arrow keys. Refer to Section 2, Paragraph 2.6.2, and Section 5, Paragraph 5.3.3, for an explanation and a procedure to select the Keypad Time–to–Lock duration.
AUDIO TONE C/F	This message informs the operator that the Audio Tone Menu has been selected from the Configuration Menu. Refer to Section 2, Paragraph 2.6.3, and Section 5, Paragraph 5.3.4, for an explanation and a procedure for selecting an alarm tone.
UP/DOWN TO ADJUST	This message appears in the Audio Tone Menu to prompt the operator to select one of five different audible alarm tones available by using the **Baby Set Temperature** or **Air Set Temperature** Up/Down Arrow keys. Refer to Section 2, Paragraph 2.6.3, and Section 5, Paragraph 5.3.4, for an explanation and a procedure for selecting an alarm audio tone.

SYSTEM/USER PROMPT MESSAGE	DESCRIPTION
TONE 1: C/F TO SET **TONE 2: C/F TO SET** **TONE 3: C/F TO SET** **TONE 4: C/F TO SET** **TONE 5: C/F TO SET**	These messages appear in the Audio Tone Menu when the operator presses the **Baby Set Temperature** or **Air Set Temperature** Up/Down Arrow keys. Refer to Section 2, Paragraph 2.6.3, and Section 5, Paragraph 5.3.4, for an explanation and a procedure for selecting an alarm audio tone.
AUDIO TONE IS SET	This message appears in the Audio Tone Menu after the operator has pressed the **°C/°F** key to enter the desired alarm tone. Refer to Section 2, Paragraph 2.6.3, and Section 5, Paragraph 5.3.4, for an explanation and a procedure for selecting an alarm audio tone.
SET INCUB NUM C/F **(SET INCUBATOR NUMBER)**	This message informs the operator that the Set Incubator Number Menu has been selected from the Configuration Menu. Refer to Section 2, Paragraph 2.6.4, and Section 5, Paragraph 5.3.5, for an explanation and a procedure to select the an Incubator number.
INCUBATOR NUMBER = 01	This message appears in the Set Incubator Number Menu to prompt the operator to select an Incubator number by pressing the **Baby Set Temperature** or **Air Set Temperature** Up/Down Arrow keys. It also appears after the operator has pressed the **°C/°F** key to enter the desired Incubator number. Refer to Section 2, Paragraph 2.6.4, and Section 5, Paragraph 5.3.3, for an explanation and a procedure for selecting an Incubator number from 01 to 99.
RESTORE DEFAULTS C/F	This message informs the operator that the Set Restore Factory Defaults Menu has been selected from the Configuration Menu. The defaults include Air Mode, Air and Baby Set Temperature, Procedural Time, Keypad Lock Time, Audio Tone and No External Interface. Refer to Section 2, Paragraph 2.6.5, and Section 5, Paragraph 5.3.6, for an explanation and a procedure to restore the factory default settings.
SETTING DEFAULTS	This message appears when the unit is turned on and in the Restore Defaults Menu and informs the operator that the Factory Defaults are being restored for Air Mode, Air and Baby Set Temperature, Procedural Time, Keypad Lock Time, Audio Tone and No External Interface. Refer to Section 2, Paragraph 2.6.6, and Section 5, Paragraph 5.3.6, for an explanation and a procedure to restore the factory default settings.